EXHIBIT 4

STANDARDS FOR DOMINANT FIRM CONDUCT:

WHAT CAN ECONOMICS CONTRIBUTE?*

by

Richard Schmalensee

SSM WP#1723-85   Revised Version: October 1985

Standards for Dominant Firm Conduct:

What can Economics Contribute?*

Richard Schmalensee

Alfred P. Sloan School of Management, MIT
Graduate School of Business Administration, Harvard

I. INTRODUCTION

In one of the more famous dicta in the <u>Alcoa</u> decision, Judge Learned Hand asserted that, "The successful competitor, having been urged to compete, must not be turned upon when he wins."[1] There is a good deal of irony in this. Hand found <u>Alcoa</u> to have monopolized, and thus to have violated Section 2 of the Sherman Act, even though its conduct would have been lawful had it been less sucessful. In the US and the EEC, firms that have been successful enough to have attained near-monopoly or dominant market positions are subject to rules of conduct stricter than those applied to other firms.[2] Highly "sucessful" firms are thus always "turned upon" to some extent. As one law professor turned executive puts it, enforcement of the US antitrust laws generally involves "beating up the winners."[3]

In this essay I explore the contributions industrial economics and industrial economists can make to debates about general rules of conduct or case-specific remedies proposed for application to firms that have attained "dominance." I limit my attention to considerations of economic efficiency, though antitrust policy may of course be employed to pursue other objectives as well. (Here and in all that follows I use "antitrust" as shorthand for "what is called 'antitrust' in the U.S. and 'competition law' elsewhere". This shorthand correctly signals my much greater familiarity with antitrust policy in the U.S. than elsewhere.)

1

I begin in Section II by defining market dominance in the antitrust context and discusssing the persistence of dominant positions over time.   Section III considers theory and historical evidence on the origins of dominant positions.

Relying on this background, Section IV argues that the efficiency consequences of "beating up the winners", by imposing rules designed to limit the returns to dominance or to hasten its erosion, are generally unknowable. (Rules aimed at preventing the acquisition of dominant positions are not explicitly considered, though most of the arguments and conclusions advanced here also apply to such rules.) Several fundamental second-best problems are unavoidable when competition is imperfect, and, as usual, second-best problems give rise to policy prescriptions too complex to be followed with any precision. As I have discussed elsewhere (Schmalensee [1982]), difficulties of this sort that are inherent in many areas of antitrust have been made visible by recent theoretical work in industrial economics.

Section V considers in general terms what economists <u>can</u> contribute to the task of devising efficiency-enhancing rules for dominant firm conduct in light of these difficulties. While humility is called for, complete agnosticism is not. The academic debate in the U.S. on rules governing predatory pricing and related practices is employed as an illustrative example. Finally, Section VI provides a brief summary of the essay's main points and their implications for policy debates in anti-trust.

II. MARKET DOMINANCE AND ITS PERSISTENCE

The meanings attached to "dominant firm" and "monopoly" in antitrust are broader than the definitions of those terms in economic theory. A "dominant firm" in economic theory is generally a single large seller facing many, small, price-taking rivals, while a "monopoly" is the only seller of some good or service. In antitrust, both terms are generally used to refer to a seller that is able to exercise substantial market power (or, equivalently, monopoly power) unilaterally, without the need for collusive arrangements. This definition of dominance or monopoly, which I adopt here, includes markets approximating (to an unspecified degree of exactness) the limiting cases of theory. Firms that pass this test are usually appreciably larger than their closest rivals, since tacit or overt collusion is typically required for the exercise of appreciable market power in oligopolistic markets.

As Landes and Posner [1981] argue, economic theory indicates that one ought to define a firm with substantial market power as one that is able to enhance its profits by raising prices substantially above marginal costs for a substantial volume of sales. The deadweight loss produced by the exercise of monopoly power provides a natural measure of substantiality reflecting both of these considerations (Schmalensee [1982]). Most firms in developed economies have some market power; only a few have enough to be characterized as "dominant" or "monopolies". There is essentially no basis in economics for the existence of a

3

sharp dividing line between "dominant" firms and others, however, since market power is naturally measured along a continuum.

Market power is often associated with market share, and judgements about the presence or absence of market power often turn on the definition of the "relevant market," especially in U.S. antitrust cases. For purposes of assessing market power, it is logical to follow Areeda and Turner [1978, p. 347] and define a "relevant market" for antitrust purposes as "a firm or group of firms which, if unified by agreement or merger, would have market power." In other words, a market is an aggregation (over space and/or products) of outputs that could profitably be monopolized, at least in the short run. (The smallest such aggregate should generally be the focus of analysis.) This definition is also generally consistent with the discussions of market definition in Landes and Posner [1981] and the U.S. Justice Department [1984] Merger Guidelines. Dominant firms commonly have large shares of sales in one or more relevant markets thus defined. But the correspondence between market share and market power is far from exact, and market share is not necessarily the best indicator of power.[4]

In the Cellophane case, the U.S. Supreme Court ruled that under Section 2 of the Sherman Act, a monopoly is a firm with "the power to control prices or exclude competition."[5] This blurs the important distinction between short-run and long-run market power. A seller with a very large share of market capacity or output is likely have considerable short-run market power, since it should be able profitably "to control prices"

4

to an appreciable extent in the short run. Exceptions may
arise when the largest firm has higher costs than its rivals or
can only produce inferior products. But long-run market power,
"the power to control price" in the face of the investment
decisions of actual and potential rivals, requires the ability
to restrict or "exclude competition". And, as the work of
Worchester [1957], Gaskins [1971], and others shows, "the power
to exclude competition" in the long run can only derive from
long-run (i.e., long-lived) advantages over actual or potential
rivals. This literature makes it clear that size does not by
itself confer such advantages. As Stigler's [1964] discussion
of the difficulty of detecting price cuts by small firms
indicates, size can even be a strategic handicap; see also
Gelman and Salop [1983].

Salop [1979] has pointed out that there are two types of
long-run advantages that may enable an established dominant firm
to preserve its market position despite assaults by "entrants",
who may be newcomers to the industry or agressive fringe firms.
(I depart from Salop's terminology in what follows.) Operating
advantages correspond to Bain's [1956] absolute cost and product
differentiation barriers to entry. A firm with operating advan-
tages has lower costs or more favorable demand conditions
(perhaps because of superior products) than any potential
entrant. Patents and trade secrets are the most obvious poten-
tial sources of such asymmetries. If a dominant firm has
operating advantages, it is simply not feasible for an entrant
to match its cost/demand position. The entrant would thus be

5

at a disadvantage relative to the incumbent in post-entry operations.

On the other hand, strategic advantages may arise in this context simply because the dominant firm appears on the market first and can acquire assets before potential entrants make their decisions. (These are called first-mover advantages in the language of game theory.) In Bain's [1956] analysis, scale economies can provide an incumbent firm with a strategic advantage: even if products are homogeneous and all firms' costs are given by the same function, if an entrant adds appreciably to industry capacity (so as to avoid being at a cost disadvantage), price may be sufficiently depressed as to render entry unattractive even though incumbents earn substantial excess profits. Strategic advantages arise when an entrant can acquire the same tangible (plant, equipment) and intangible (technology, reputation) assets as an established firm but can only do so on less favorable terms. Unlike operating advantages, strategic advantages are not eroded by the expiration of patents or the diffusion of knowledge among potential entrants. But if sucessful entry does occur, strategic advantages do not help the incumbent firm in post-entry competition.

As Geroski and Jacquemin [1984] have emphasized in their valuable overview of the relevant theoretical literature, dominant firms may obtain strategic advantages from many sources.[6] Generally these involve the ability of established firms to make irreversible, long-lived investments in tangible or intangible assets before entrants appear. That is, sunk

6

costs (Baumol and Willig [1981]) must be present and important.
By incurring sunk costs in a strategic manner, an incumbent may
be able to make a commitment that makes credible a threat to
respond harshly to entry. (A threat is credible if and only if
it would be in the interest of the threatener to carry it out;
non-credible threats are bluffs. See Dixit [1982] for a nice
exposition of these and related concepts.) Spence [1981a]
terms such investments pre-entry positioning moves, as opposed
to post-entry reactions to new entry. As Spence emphasizes,
both sorts of actions generally involve a waste of resources,
as do entrants' attempts to respond. (On this latter point,
especially, see Hillman [1984].)

A second common theme in the literature on strategic advan-
tages is the existence of scale economies of one sort or another,
following Bain [1956]. Scale economies make it uneconomic for
an entrant to appear at such a small scale that no substantial
competitive response to its entry would be rational. If such
entry is possible, pre-entry market conditions fully describe the
post-entry environment.

Spence's [1977] seminal rehabilitation of the concept of
entry deterrence furnishes the standard example of strategic
advantage and of pre-entry positioning by an established firm.
In this paper and the large literature to which it has given
rise, an incumbent monopolist faced with the threat of entry
rationally makes larger irreversible investments in production
capacity than it otherwise would. These socially inefficient
investments make vigorous reaction to entry more attractive to

7

the incumbent by lowering its marginal costs for high levels of output.   This in turns makes entry less attractive, especially in the presence of scale economies.   (Interesting recent contributions to this literature include Bulow, et al [1985a] and Eaton and Lipsey [1981].)   In order for this mechanism to be an important source of persistent dominant firm profits, however, scale economies must be unusually important by U.S. standards (Schmalensee [1981b]).

Pre-entry investment in long-lived capacity is not the only potential source of strategic advantage for dominant firms.   In markets in which buyers incur direct or opportunity (Schmalensee [1982c]) costs of switching to new brands, the first firm to make substantial sales acquires a strategic advantage over later entrants, which may serve to deter entry in the presence of scale economies.   No inefficient, positioning investment is required to obtain this advantage, though its optimal exploitation may involve sacrificing profits in order to penetrate the market more rapidly than would be optimal if there were no threat of subsequent entry.

In some situations, established dominant firms can rationally make preemptive investments that eliminate avenues along which entry might occur.   Such investments may involve new products that crowd geographic (Eaton and Lipsey [1979]) or product (Schmalensee [1978]) space.   Alternatively, as Gilbert and Newbery [1982] have shown, an incumbent may be able profitably to preempt potential new technologies by accelerating its own research and development efforts, even in the absence of

8

scale economies. It is easy to over-state the importance of preemptive strategies, however. Preemptive investment in R&D, in particular, is possible only under fairly restrictive conditions on the invention/innovation process and the set of potential new technologies.[7]

Advertising may have long-lived effects on buyer behavior, and pre-entry investment in advertising may be a source of strategic advantage. But the competitive effects of such investments depend critically on the way advertising affects buyers; advertising may tilt competition in favor of later entrants under some conditions (Schmalensee [1983]). See Fudenberg and Tirole [1984] and Bulow, et al [1985b] for general discussions of the issues involved.

An incumbent dominant firm's strategic advantages may be rationally exploited by aggressive reactions to entry. It may be rational to engage in predation to prevent outsiders from matching the established firm's knowledge of cost and demand conditions (Scharfstein [1984]). It may also be rational to engage in predation to build a reputation for toughness that will discourage other potential entrants (Kreps and Wilson [1982], Milgrom and Roberts [1982]) or facilitate merger on favorable terms (Saloner [1985]). Similarly, a rational incumbent may attempt to eliminate rivals before they have been able to demonstrate their competence to suppliers of capital (Benoit [1984], Fudenberg and Tirole [1985]). Advertising may rationally be used as a predatory weapon under some conditions (Hilke and Nelson [1984]). And the work of Salop and Scheffman [1983]

suggests that established firms may be able credibly to threaten a variety of wasteful, cost-increasing reactions to entry (such as litigation) without making any pre-entry positioning moves.

Finally, the presence of firm-specific (i.e., proprietary) learning economies can create both strategic and operating advantages. (See Spence [1981b] and Fudenberg and Tirole [1983] for theoretical analyses and Lieberman [1984] for interesting evidence on the importance of proprietary learning economies.) An established firm may be able to lower its costs well below those of potential entrants by increasing output before the threat of entry appears. Once it has done this, it has acquired operating advantages. Because later entrants face competition that the first mover did not, they cannot expect to be able to invest in lower costs by increasing output on the same terms that the established dominant firm faced.

Unfortunately, the theoretical prediction that dominant positions not protected by strategic or operating advantages will tend to decay tells us nothing about the speed with which such positions decay in real markets. This is an empirical question. Similarly, even though a large number of strategic and operating advantages can in theory prevent entry indefinitely, one cannot conclude that real dominant positions never decay. In a world in which tastes and technologies change and managements protected from competition tend to go soft, one expects dominant firms' advantages to retard the growth of competition, not to exclude it completely and forever. Moreover, as Caves, et al [1984] emphasize, a dominant firm with weak advantages over actual and

potential competitors may choose to accept the inevitability of
its own decline and concentrate on maximizing short-run profits,
rather than spending money to deter potential new entrants or to
discourage aggressive rivals. A second empirical question is
then the importance of the strategic and operating advantages
discussed in the theoretical literature in preventing or retard-
ing the decay of dominance in real industries.

Most studies of the evolution of dominant positions do not
focus clearly on either of these questions. Weiss and Pascoe
[1984] have argued that dominance has tended to persist in recent
years, for instance, and Mueller [1977] has argued that inter-
firm profitability differences also persist over long periods,
but neither paper tells us why. (See also Geroski [1986] and the
reference he cites on the persistence of large market shares.)
Study of the evolution of firms with large market shares created
by mergers in the U.S. between 1882 (Standard Oil) and 1903 (the
Northern Securities decision) seems a very promising source of
answers. A contemporary observer identified 78 large mergers in
this period resulting in firms controlling at least half the
output of their industries.[8]

For instance, if one assumes that U.S. Steel had no long-run
advantages over its rivals (see note 10, below, and Chandler
[1977, p. 361]), the decline in its market share from 66% in 1901
to 42% in 1925 (Stigler [1965]) may be taken as suggestive of a
half-life of purely short-run dominance of about 37 years.[9] This
seems very slow decay indeed, and Geroski's [1986] analysis
suggests that it is not unusual. But, as Caves, et al [1984]

11

note, a sizeable number of apparently dominant firms formed in
the same merger movement failed within a few years of their
creation; see Chandler [1977, ch. 10] for discussion of some
examples. Caves and his associates study 34 large mergers that
survived until 1929 and present evidence that firms with weak
advantages suffered more rapid declines in market share than
others but enjoyed higher profits. They attribute this pattern
to rational decisions to harvest weakly-protected dominant posi-
tions even if entry was thereby accelerated.

Overall, the pattern that emerges is mixed. Some firms that
apparently began with dominant positions vanished quickly: the
National Cordage Association failed three years after its
formation (Chandler [1977, pp. 329-330]). But some firms
created around the turn of the century remained dominant for a
half-century or more: consider Eastman Kodak and United Shoe
Machinery. Market dominance is not inevitably long-lived, but
if it is protected by substantial and continuing operating or
strategic advantages, it may persist for many decades.

III. SOURCES OF MARKET DOMINANCE

Restrictions on the conduct of dominant firms limit the
returns to the activity of creating market dominance. The
literature contains two competing characterizations of this
activity. The first follows Posner [1975] and emphasizes
rent-seeking, while the second follows Schumpeter [1942] and
stresses innovation.

Posner [1975] argued that there are no barriers to entry to the business of creating monopolies, so that the average returns to this activity should be competitive. (One might think about the business of increasing concentration through horizontal mergers in this context.) If, as he contended, this activity is not itself directly productive, one would expect that on average the present value of the profits of new monopolies should equal the costs expended in competing for their ownership. That is, the rents produced by monopoly should be fully dissipated in the activity of monopoly creation. If this is correct, the social costs of monopoly may be very large indeed; see Cowling and Mueller [1978] for some estimates for the U.S. and the U.K.

There are two basic problems with this view, however. First, the assumption of full dissipation is likely to be too strong. Rents will not be fully dissipated if risks and risk-aversion are important (Hillman and Katz [1984]) or if competition for monopoly ownership is imperfect (Tullock [1980]). The latter point seems particularly relevant. While everybody would like to own a dominant firm, historically it is hard to find evidence of vigorous competition for many dominant positions. The number of people in a position to contemplate consolidation of the U.S. steel industry in 1901 could not have been large; the number who both recognized the potential gains and expended resources to secure them must have been much smaller. In fact, no evidence of any competition for this particular opportunity is apparent to the reader of the standard secondary sources.

13

A second problem with the rent-seeking/rent-dissipation view is raised by Demsetz [1976]. Posner's [1975] paper and the literature to which it has given rise concentrate on attempts to use the government to create dominant positions. Here one can find evidence of competition through lobbying and other means, though that competition may often be imperfect. (It is presumably no accident that Lyndon Johnson's relatives were granted lucrative rights to operate several television stations in Texas while he was majority leader of the U.S. Senate.) But most dominant positions are not critically dependent on legislation or administrative decisions. In those cases, Demsetz asks, in what socially unproductive, rent-seeking activities can would-be monopolists invest? At the very least, the literature contains no documented examples of substantial investments of this sort unconnected with attempts to influence government decisions. This goes mainly to the question of rent dissipation, of course; horizontal mergers for monopoly may be directly unproductive but require small (net) investments and thus be highly profitable.

Demsetz [1976] gives a Schumpeterian answer to his own question. He contends that would-be monopolists invest in building better mousetraps and that actual monopolists are those who succeed. And one can certainly find examples of apparently dominant firms whose initial market positions derived in large measure from innovation: Alcoa, Gilette, Eastman Kodak, and Xerox come quickly to mind. But this purely Schumpeterian view is incomplete as an empirical matter, and it

14

has no rigorously defensible welfare implications. The promoters of the U.S. Steel merger were surely not engaged in innovative activity in any usual sense of that term. And, while IBM's rise to dominance in the business segment of the mainframe computer market did require innovation, it was certainly facilitated by that firm's prior market position in punched card tabulating machines and by its rivals' early mistakes. Finally, on the normative front, a large literature has now made it clear that Schumpeterian competition can lead to technical progress that is sometimes faster and sometimes slower than the optimum.

Chandler's [1977] study of the origins of large U.S. firms in the years before World War I suggests that on balance innovation, broadly defined, played an important part in the creation of persistent dominant positions in the U.S.. His thesis is basically that innovations in transportation and communications in the nineteenth century created potential economies of scale in some industries and made new forms of production and distribution attractive in others. Some large firms arose because innovative entrepreneurs saw these opportunities and sought to take advantage of them; the large railroads, Swift & Co., Montgomery Ward, and Sears provide clear examples. Others large enterprises were created by mergers because existing cartels were perceived as suboptimal or, after 1897, illegal. Examples here include Standard Oil, National Cordage, and National Lead. Chandler discusses many intermediate cases that

15

involved both response to new opportunities and avoidance of competition.

Chandler [1977, pp. 337-344] goes on to argue that success-ful consolidations (as measured by profitability) generally had two common features. First, they took place "in the high-volume, large-batch, or continuous process industries and in those needing specialized marketing services [p. 338]," that is, in the industries in which technical change had created new opportunities. Second, he contends that "mergers were rarely successful until managerial hierarchies were created -- that is, until production was consolidated and until the firm had its own marketing and purchasing organizations [p. 338]."[10]   A central argument of Chandler's book is that the creation of managerial hierarchies was generally an act of innovation in this period, and it was certainly directly productive. Large firms created in industries where there were no scale economies tended to perform badly, especially if managerial hierarchies were not created to impose effective central direction. On the other hand, scale economies were sometimes exploited to produce strategic advantages that protected dominant positions for decades.

Though Chandler's main focus is on the U.S., his central arguments have to do with the consequences of technical change, not with U.S. institutions. Thus his work is at least suggestive about the creation and evolution of market dominance outside the U.S.. On the other hand, for various reasons, horizontal mergers seem to have played a greater role in the creation and mainten-

ance of dominant positions in other countries; see, for instance, Hannah and Kay [1977]. This may well reflect more rent-seeking activity.

The discussion here and in Section II leads to the following view of the positive economics of market dominance, which I adopt in what follows. Firms may achieve short-run dominance through merger or other actions that are not directly productive. But most dominant positions, particularly those created in the U.S. after "merger for monopoly" was ruled illegal in 1903, have their origins to an important extent in innovation, broadly defined. Firms that attain short-run dominance by merger or other means but have no advantages over actual and potential rivals and are badly managed tend to perform poorly and lose dominance in a matter of years. In other cases, dominant positions may take many decades to decay appreciably, especially if strategic or operating advantages can be exploited by pre-entry positioning moves or post-entry reactions. In the presence of such advantages, the rate of decay of its market position is to some extent under a dominant firm's control; it can sacrifice current profits to slow the erosion of its market share.

IV. RESTRICTIONS ON CONDUCT AND SECOND-BEST PROBLEMS

In light of the foregoing, I now outline some basic problems encountered by attempts to devise efficiency-enhancing restrictions on the conduct of dominant firms. The fundamental point here is that in imperfectly competitive markets, one must

17

generally solve second-best problems in order to derive efficiency-enhancing rules or remedies.

Classically, second-best problems arise because the impact of changes in one market is affected by distortions in other markets. Thus if the price of oil is above (social) marginal cost, the optimal price of coal is given by a complex formula that is unlikely to describe the result of unregulated competition. Antitrust analysts typically duck problems of this sort (see, for instance, Scherer [1980, pp. 28-29]), and I will follow suit. But recent theoretical work in industrial economics has made clear the existence of serious single-market second-best problems that are harder to duck. That is, if one or more of the necessary conditions for perfect competition is violated in the coal market, it may not be optimal to move toward satisfaction of any of the other necessary conditions in that market. In this Section, I outline some of the single-market second-best problems that arise in connection with the antitrust treatment of market dominance.

Let us initially ignore the long-run effects of antitrust policy on activities aimed at the creation of dominance. I term the effects that remain short-run for simplicity, though it should be clear from the discussion above that the short run can be very long indeed by usual standards.

Consider first rules aimed at limiting the exploitation of a dominant firm's market power. The clearest case for short-run efficiency gains is provided by the doctrine under Article 86 of the Treaty of Rome that high prices can constitute abuse of a

18

dominant position.   (See Fox [1984] for a discussion of (and an American reaction to) the relevant EC Court of Justice cases.) The implicit rule or restriction is that a dominant firm's prices cannot be "too high".   Putting aside the costs of comprehensive price regulation by non-specialists of firms in many different sectors and ignoring possible multiple-market second-best problems, the short-run efficiency properties of this rule are clear.   Society as a whole gains if monopoly prices are reduced, as long as they are not reduced below marginal cost.

Other rules with this same aim have less predictable effects on economic efficiency, however.   Limits on price discrimination may reduce the returns to dominance, but the welfare effects of prohibiting classic third-degree price discrimination or tying arrangements used to implement second-degree discrimination (via two-part tariffs) are ambiguous.   (See Varian [1985] and Schmalensee [1981b], respectively.)   Similarly, limitations on the ability of firms with market power to impose restrictions on their customers may enhance or reduce economic efficiency in theory, and economists have recently come to believe that reductions are more likely.   (It should be noted that one cannot easily explain this shift of opinion by pointing to new evidence.)   Overstreet's [1983] careful analysis of vertical price-fixing, wherein a manufacturer sets retail prices, reveals the multitude of conflicting theories and bits of evidence that consititute the state of knowledge in the area of vertical restrictions.

19

Rules designed to hasten the erosion of dominant positions by facilitating new entry or the expansion of fringe firms have been shown to have similarly ambiguous consequences for economic efficiency. As von Weizsacker [1980a, 1980b] has argued, barriers to entry that (following Bain's [1956] definition) permit established firms to earn supra-competitive profits are not necessarily inefficient when all the conditions necessary for classical perfect competition are not present. A reduction in entry barriers may result in a loss of efficiency.

This is easiest to demonstrate when the persistence of dominance rests in part on operating advantages. Elimination of such advantages in order to facilitate entry may replace low-cost monopoly by high-cost competition. Following Williamson's [1968] pioneering treatment of this problem, suppose a market with a linear demand curve is served by a monopolist with constant unit cost C that charges a price P. Suppose that antitrust can eliminate the dominant firm's advantage and produce a competitive market with price and unit cost equal to C' > C. Then a bit of algebra shows that net welfare (consumers' surplus plus producers' profits) increases if and only if

$$(1) \quad C' < [2-(3)^{1/2}]P + [(3)^{1/2}-1]C = [.268]P + [.732]C$$
$$= P[1 - (.732)L],$$

where L is the Lerner measure of the (original) degree of monopoly, equal to (P-C)/P.

As Williamson stressed, a price reduction (C' < P) is necessary but not sufficient for a welfare gain. The stronger

20

the original monopoly position, as measured by L, the greater the price reduction required to offset the elimination of operating advantages. Equation (1) is a simple formula, but it is hard to imagine antitrust authorities having sufficient information to implement it in particular cases without a substantial chance of error. It is even harder to see how (1) could be used as the basis for a general rule to be applied to all dominant firms.

Even if a dominant firm's operating advantages are untouched, antitrust policy that facilitates entry may reduce efficiency. Suppose that a dominant firm's position is as above and that there is a single potential entrant with constant unit cost C', with C < C' < P. If the second firm enters and post-entry behavior is Cournot, competition is increased and price is reduced. But, following Schmalensee [1976], efficiency is enhanced under these assumptions if and only if

$$(2) \quad C' < [5/11]P + [6/11]C \; = \; [.455]P + [.545]C$$
$$= \; P[1 - (.545)L].$$

This imposes a less stringent test than (1). Higher values of C' are consistent with increased efficiency even though the post-entry price exceeds C' in Cournot equilibrium.

Somewhat surprisingly, a test of intermediate stringency emerges when the queue of potential entrants is long. That is, suppose that N firms enter with cost C' under the assumptions above. Then as N increases without bound, price falls to C' and the condition for welfare improvement is

21

(3) $C' < [1/3]P + [2/3]C = [.333]P + [.667]C$
     $= P[1 - (.667)L].$

This is less stringent than (1) because the low-cost firm is still producing; it is more stringent than (2) because the low-cost firm has a smaller market share in the limiting equilibrium.

Conditions (2) and (3) would be even more difficult than (1) to apply in particular cases or in the design of general rules, since the number and costs of potential entrants are likely to be very difficult to estimate accurately. Conditions (2) and (3) make clear that privately profitable high-cost entry may be socially inefficient when competition is imperfect. Policies that encourage such entry may therfore reduce economic efficiency, even though they hasten the erosion of dominant positions.

Economies of scale or learning rule out market equilibria or efficient outcomes with many sellers and thus force analysis into the realm of the second-best. A number of authors, including von Weizsacker [1980a, 1980b], Perry [1984], and Mankiw and Whinston [1985], have shown that if established firms lack operating advantages and take no actions to exploit strategic advantages to deter entry, too much entry generally occurs when scale economies are present. This occurs because potential entrants do not take into account the fact that their entry would raise the costs and lower the profits of existing firms. That is, even though economies of scale give rise to Bainian entry barriers, entry is likely to be excessive from

22

the viewpoint of economic efficiency, not deficient. Antitrust
policy that prevents the exploitation of strategic advantages
or otherwise facilitates entry may reduce efficiency under
these conditions, even though it enhances competition and
reduces wasteful investment in pre-entry positioning. And
von Weizsacker [1980a] has argued that Bainian entry barriers may
contribute to social efficiency in other settings as well.

Still restricting attention to the short-run effects effects
of rules designed to facilitate entry in order to erode dominant
positions, two additional problems deserve mention. First,
Spence [1981a] has noted that restrictions on permissible
reactions to entry, which are the most frequently discussed
anti-monopoly rules in the U.S., may not in fact prevent dominant
firms from deterring entry. Such restrictions may instead
cause dominant firms to increase the resources they devote to
pre-entry positioning moves. Such investments are generally
wasteful, as are potential entrants' attempts to offset them
(Hillman [1984]). But, as Spence [1981a, p. 60] points out,
"... there are no known, unambiguously beneficial simple rules
that can be applied to investments prior to entry..." That is,
positioning is even harder to regulate efficiently than reac-
tions. Second, Bernhein [1984] has shown that when potential
entrants appear sequentially over time, policies that make
entry deterrrence more difficult may have the perverse effect
of discouraging entry on balance. If tomorrow's entry cannot
be deterred, today's entry may not occur.

23

I have argued so far that, aside from regulation that forces monopoly prices closer to marginal costs, it is hard to find rules designed to limit the ability of dominant firms to exploit their market positions that are unambiguously efficiency-enhancing in the short run. And it may be even more difficult to design rules that will both hasten the erosion of dominant positions and improve economic welfare in the short run. The use of strategic and (especially) operating advantages to deter entry is not necessarily socially undesirable. When we consider the long-run effects of restrictions on dominant firm conduct, a new set of difficulties appear, and even the efficiency properties of price ceilings are seen to be unclear in principle.

Rules that limit the short-run returns to dominant positions or hasten their erosion reduce the attractiveness of investments aimed at producing market dominance. If all such investments represented directly unproductive rent-seeking, such rules would be efficiency-enhancing on this score.

But, as I argued in Section III, life is not so simple. Many dominant positions are at least in part attributable to innovative activity, broadly defined. Policies that reduce the present value of market dominance thus reduce the returns to innovation. Despite the importance of innovation in advancing economic welfare, however, it does not follow that all restrictions on dominant firms have undesirable long-run effects. Reductions in patent lifetimes also reduce the returns to innovation, but it does not follow that the optimal patent

24

lifetime is infinite. And, despite Schumpeter's [1942] eloquence, there is no good reason to think that unrestricted market competition produces the optimal rate and direction of technical progress.

The patent analogy is both instructive and depressing. Attempts to deduce the optimal patent lifetime serve mainly to make clear the intractible nature of this problem. (See Nordhaus [1969] for the most important attempt at its solution; Scherer [1977, pp. 25-34] surveys the literature.)   Again we are in the realm of the second-best; longer patent lifetimes encourage innovation but prolong monopoly. A host of clearly arbitrary, special assumptions are required to produce a quantitative "solution".   The analogous problem of the optimal degree of severity of restrictions on dominant firms is even less tract-able, for two reasons. First, while innovative activity may be an important source of dominant positions, it is plainly not the only source. To an unknown extent, restrictions on dominant firms also lower the returns to directly unproductive rent-seeking. Second, there is no single variable in the dominant firm context that corresponds directly to patent lifetime. Antitrust policy is multi-dimensional and cannot reliably dictate the lifetimes of dominant firms.

When the long-run effects of restrictions on dominant firms are considered, then, the ambiguity revealed by short-run analysis deepens. In particular, restrictions on the level of prices charged by dominant firms are no longer clearly efficiency-enhancing. Even if patents are not involved, such

25

restrictions are likely to reduce the returns to innovation, broadly defined.

I must admit that this long-run analysis strikes even its author as somewhat academic in the context of current antitrust policies in the U.S. and Western Europe. The gains to entrepreneurs and/or shareholders from creating an enterprise like Xerox or IBM are currently so enormous that it is hard to believe that even a sizeable percentage reduction in those rewards would have much effect on innovative activity. But this is purely an opinion; I know of no hard evidence that could be used to make it into a rigorous argument.

V. POTENTIAL CONTRIBUTIONS OF ECONOMICS AND ECONOMISTS

The preceding analysis is depressing stuff for an economist interested in antitrust policy. The arguments of Section IV imply that such an economist can never hope to prove that any proposed general rule restricting dominant firm conduct would increase or decrease efficiency in all cases. Further, contemplation of the unusually simple rules presented in Section IV in light of the state of empirical knowledge in industrial economics suggests that it will rarely be possible to support rigorously an assertion that any proposed general rule will enhance efficiency in most cases or that the costs of adopting (or not adopting) it will outweigh the benefits. Moreover, second-best problems make it nearly impossible to analyze rigorously and

completely the efficiency consequences of many sorts of case-specific rules, even if long-run effects are ignored.

Recognition of these problems should make us bit more humble than many economists have been or seemed to be in the past. But I do not think that we need to be absolutely silent in debates about general rules or particular cases. In this Section I present three principles that economists can use to make positive contributions in debates on antitrust policies toward dominant firms and illustrate my general remarks with a brief discussion of the U.S. debate on predatory practices. (For a broadly similar sermon, addressed by a U.S. law professor (now judge) to his peers, see Easterbrook [1984].)

<u>First</u>, rules designed to "beat up the winners" should only be applied to genuine winners. That is to say, rules that have as their main raison d'etre their ability to reduce the value of dominant positions or to hasten their demise should only be applied to dominant firms, sellers with unusually important monopoly power. This simple observation has implications for both rule-making and the analysis of particular cases.

In the U.S., for instance, rules against tying contracts and price discrimination apply, in principle at least, to firms with small amounts of market power (Landes and Posner [1981]). Since the efficiency properties of these restrictions on conduct are unclear if market structure is taken as given, it is not apparent why they should be imposed upon non-dominant sellers without much monopoly power. If a firm has little monopoly power, the potential gains from limiting the returns to that power or

27

hastenings its erosion are correspondingly small. On the other

hand, the efficiency case against applying these rules to

dominant firms is less clear, since they may serve to alter

market structures in a pro-competitive direction. But if such

a tax on dominance is imposed, it should clearly be accompanied

by an economically valid test for dominance. Economists have a

good deal to say about such tests (see Section II, above) and

about their application to particular cases. The same progress

in industrial economics that has weakened our confidence in

normative prescriptions has strengthened our ability to diagnose

market power.

Second, I think that the efficiency effects of proposed

general rules or case-specific remedies should be debated, even

if economists cannot analyze them completely and rigorously. Two

plausible presumptions can serve to structure such debates.

On the one hand, in light of the many virtues of the market

mechanism, general rules or case-specific remedies that would

alter the outcome of market processes ought not to be adopted

unless supported by a plausible argument that short-run

efficiency, in the sense of Section IV, is likely to be enhanced,

even if the overall, long-run, net effect must remain unknow-

able. This presumption, for instance, suggests that the burden

of proof should be borne by those who would prevent dominant

firms from engaging in business practices that are not uncommon

among non-dominant firms; their use by such firms would seem to

create a rebuttable presumption that they contribute to

efficiency.

28

On the other hand, a generally pro-competitive antitrust policy seems more likely to enhance efficiency than a policy aimed at any alternative well-defined objective, and government intervention without well-defined objectives is likely mainly to produce mischief. I would accordingly contend that there should also be a rebuttable presumption that increasing the effectiveness of competition is likely to increase economic efficiency, as long as promoting competition is clearly distinguished from protecting competitors.[11] It follows from this, for instance, that the argument that purely punative measures taken against dominant firms <u>might</u> in theory increase welfare by reducing rent-seeking should not serve to rationalize the imposition of such measures.

I think the preceeding two paragraphs give a fair description of the approach most economists (in the U.S., at least) in fact apply to antitrust issues. The only real novelty here is the explicit recognition that this approach is <u>not at all</u> the same thing as rigorous analysis of economic efficiency. A responsible expert in the public arena should not claim too much for his expertise. And we must recognize that the state of our knowledge is such that competent economists will continue to disagree as to the plausibilty of efficiency arguments and the likelihood of enhanced competition, both in general and in particular cases. Moreover, the two presumptions advanced above are not fully consistent: they treat differently business practices that are likely to contribute both to the efficiency of a dominant firm's operations and to the preservation of its

29

market position.   Competent economists will also continue to disagree about the relative values of operating efficiency and enhanced competition in such contexts.

This second principle is a weak in a number of senses.   But it can be quite powerful in some situations.   It requires that arguments about efficiency and competitive effects be presented and critically evaluated before intervention in market processes is supported.   And it is not hard to find examples of antitrust rules or decisions for which no remotely plausible efficiency or competitive arguments exist: the differential treatment of price and non-price vertical restrictions in U.S. antitrust law comes immediately to mind.

Third, economists should take seriously the social value of predictable rules of law.   The less predictable are antitrust decisions, the more risk is borne by society as a whole, and risk-bearing and risk-shedding actions are socially expensive. If industrial economics generally permitted clear efficiency conclusions to be drawn from rule-of-reason analysis of particular cases, the value of predictability might be over-shadowed by the errors that would result from the application of simple, bright-line standards.   But in many situations involving dominant firms, the most careful, long, and expensive studies imaginable of the efficiency consequences of particular rules will not produce definitive answers.   One knows in advance that competent economists will continue to disagree even after a long and well-run trial and/or the publication of a barrage of articles in the journals.

30

The alternative is to limit the scope of antitrust proceedings to issues that can be reliably decided and to employ simple general rules as extensively as possible. Rules in the US against price-fixing and horizontal mergers for monopoly permit short proceedings and probably (but not demonstrably) enhance efficiency. To replace them by rule-of-reason standards would make antitrust litigation more expensive and antitrust decisions less predictable, and it is hard to believe economic efficiency would be on balance enhanced. Economists can speak confidently (if not unanimously) on issues of monopoly power and effects on competition; these can be part of relatively simple rules for deciding antitrust cases. But this leaves us well short of classic, unstructured rule-of-reason proceedings. Indeed, a currenly popular prescription with which I generally agree is to move toward "structured rules of reason"; short algorithms for making decisions about specific allegations. (See the discussion of predatory pricing below.)

As in macroeconomics, we should take seriously the implications of our inability to engage in useful "fine-tuning" of economic processes. In contrast to macroeconomics, however, there is no new body of theory suggesting that it is impossible in principle to improve on unregulated imperfectly-competitive markets. That is, the argument for predictability and simplicity is not an argument for laissez-faire. It simply implies that attempting to attain unattainable precision is likely to be expensive, both directly and indirectly, and antitrust authorities should, like Ulysses, tie themselves to the mast to

31

avoid temptation. It is important to note that the result of
such an approach may be either softer or tougher than the
status quo; it all depends on the sort of rules and procedures
that are adopted.

When competent economists disagree on the best simple anti-
trust rule in a particular context, society may in many circum-
stances risk little by using predictability and administrative
simplicity to settle the argument. But if antitrust is to be a
coherent policy, concerned with its natural objective of economic
efficiency, the scope for non-economic evidence in antitrust
proceedings must be limited. Antitrust decisions should be based
primarily on general presumptions or case-specific arguments
about competition and efficiency; other considerations should
come into play only as tiebreakers.

The debate in the U.S. on optimal antitrust rules to cover
"predatory pricing" and related reactions to entry by dominant
firms can serve to illustrate the application of these three
principles. This debate was triggered by Areeda and Turner
[1975].[12] They noted that prices below short-run marginal cost
could not be profit-maximizing, were too low from the point of
(very) short-run economic efficiency, and could serve to elimi-
nate new sources of competition. They contended that short-run
average variable cost was the best available proxy for short-run
marginal cost. (I think it would have been better to argue that
short-run average variable cost is likely to be the best avail-
able proxy for the estimate of short-run marginal cost used by
decisionmakers.) These arguments led them to propose that a

dominant firm found to have set prices below short-run average
variable cost in response to entry should be found in violation
of Section 2 of the Sherman Act. I find the efficiency argument
underlying this proposal plausible, and thus consistent with
the second principle above, though as Scherer [1976] and others
have pointed out, the Areeda-Turner analysis is hardly complete
or rigorous.

Scherer [1976] advocated replacing the simple, bright-line
Areeda-Turner test by a full-blown, efficiency-oriented, unstruc-
tured, rule-of-reason analysis of cases involving allegations of
predation. If I thought that such analyses were likely to be
worth more on average than would they cost, I would agree. The
Areeda-Turner rule is surely likely to produce inefficient
outcomes in a non-trivial fraction of all predation cases. But
Scherer's own description of the factors that would have to be
considered in a complete rule-of-reason analysis convinces me
that the incremental costs are likely to dwarf the incremental
benefits, especially when account is taken of the greater risk
that such a process would impose on dominant firms and on both
actual and potential entrants. (See also the response by
Areeda and Turner [1976].) If one attaches any substantial
value to simplicity and predictability, one must apply the
third principle above and reject Scherer's proposal.

Baumol [1979] and Williamson [1977] have proposed alterna-
tive tests for predation that do not involve comparing post-entry
prices with costs. Their tests involve restricting the changes
a dominant firm can make in its pricing in response to the

33

entry or exit of rivals. The welfare argument underlying both
proposals is that limiting a firm's reaction to entry forces it
to lower its pre-entry prices if it wishes to discourage entry,
and, since entry is relatively rare in most industries, pre-entry
prices are more important than post-entry prices. This too is
plausible. But I think adoption of either proposal would lead
to much more complex and uncertain litigation than would variants
of the Areeda-Turner rule. (See the case-specific discussion in
Schmalensee [1979].) I would thus trade a simpler test for
weaker efficiency arguments in this instance, though clearly this
is a personal and debatable choice.

Sticking with variants of the Areeda-Turner approach, Posner
[1976] argues plausibly that there is no efficiency case for
ruling any prices above average total cost illegal. This is not
a fully rigorous argument, of course: conditions (2) and (3)
above make it clear that if a dominant firm has operating advan-
tages, a price above average total cost can be below the cost of
an entrant whose successful entry would be socially beneficial.
(See also Roberts [1985] and the literature he cites on the
proposition that successful and socially undesirable predation
need not involve sales below cost.) But, as there is no real
hope of incorporating conditions like (2) or (3) in a general
rule, Posner's proposal seems sensible.

Joskow and Klevorick [1979] have argued for a two-tier
approach, in which the courts would throw out cases in which the
structural conditions were not condusive to rational and effec-
tive predation before applying any cost test. This is perfectly

34

consistent with the first of the principles discussed above: rules aimed at dominant firms in principle should only be applied to dominant firms in practice. It also applies the second principle by limiting the application of rules against predation to situations in which predation might serve to inhibit the erosion of dominant positions.

The argument so far suggests the beginnings of a structured rule-of-reason approach to predation cases. First, apply the first-tier Joskow-Klevorick test, and dismiss any cases not involving dominant firms operating in markets in which predation could be anti-competitive. Second, dismiss cases involving prices above the dominant firm's average total cost. Third, rule prices below short-run average variable cost illegal. This leaves a sizeable grey area, involving prices between average total cost and short-run variable cost. In light of all that has been written on this topic, it seems unlikely that economists will soon agree on the best treatment of such prices.

It follows that simplicity and, possibly, other considerations should be invoked to devise rules governing dominant firms that price between short-run average variable cost and average total cost in response to an entrant. Ordover and Willig [1981], for instance, define predation as actions that would not be profitable unless they had the effect of eliminating a rival. They call this "an economic definition," but it plainly reflects the dictionary definition of "predation" and basic notions of fairness rather a rigorous analysis of economic efficiency. (See, for instance, demonstrations by Saloner

[1985] and Schwartz [1984] that application of this definition
may reduce efficiency.) But this is not really a serious
criticism to my mind. If one feels that the rules that Ordover
and Willig derive from their definition (and the derivation is
"economic" even if the definition is not) were simple and did
not conflict with anything in the preceding paragraph, society
would likely lose little by adopting them. (I am not personally
persuaded that their rules pass these tests, however.)

VI. CONCLUSIONS AND IMPLICATIONS

Economists have produced a great deal of interesting theory
about the nature, origins, and persistence of market dominance.
Our factual knowledge is much less systematic and impressive. We
know that strategic advantages, unrelated to operating efficien-
cies, can retard the erosion of market dominance, but it is not
clear how important this mechanism is in practice. We know that
dominant positions may derive from rent-seeking and from innova-
tion, but we do not know much about the typical mix. Moreover,
the more carefully we study economic efficiency questions in
markets that have dominant firms (or are imperfectly competitive
for other reasons), the more complex are the second-best problems
we encounter.

All of this should make us humble about our ability to
prescribe efficiency-enhancing general antitrust rules or case-
specific remedies. But I do not think that it should reduce
economists to silence in this area -- even if one could imagine

REFERENCES

AREEDA, P., and TURNER, D., 1975, "Predatory Pricing and Related
Practices under Section 2 of the Sherman Act," Harvard Law
Review, 88 (February), pp. 697-733.

_____, 1976, "Scherer on Predatory Pricing: A Reply,"
Harvard Law Review, 89 (March), pp. 697-733.

_____, 1978, Antitrust Law III (Little, Brown, Boston).

BAIN, J., 1956, Barriers to New Competition (Harvard University
Press, Cambridge).

BAUMOL, W., 1979, "Quasi-Permanence of Price Reduction: A
Policy for Prevention of Predatory Pricing," Yale Law
Journal, 89 (November), pp. 1-26.

_____ and WILLIG, R., 1981, "Fixed Costs, Sunk Costs, Entry
Barriers, Public Goods, and the Sustainability of Monopoly,"
Quarterly Journal of Economics, 96, pp. 405-431.

BENOIT, J.-P., 1984, "Financially Constrained Entry in a Game
with Incomplete Information," Rand Journal of Economics,
15 (Winter), pp. 490-499.

BERNHEIM, B.D., 1984, "Strategic Deterrence of Sequential Entry
into an Industry," Rand Journal of Economics, 15 (Spring),
pp. 1-11.

BULOW, J.I., GEANAKOPLOS, J.D., and KLEMPERER, P.D., 1985a,
"Holding Idle Capacity to Deter Entry," Economic Journal,
95 (March), pp. 178-182.

_____, 1985b, "Multimarket Oligopoly: Strategic Substitutes

such an outcome. While our ability to deal with questions of economic efficiency and competitive effectiveness is limited, nobody else can do better. If the only effect of economists' contributions to antitrust policy debates were to promote efficiency and competition as goals, we would make a substantial contribution. An active antitrust policy without clear objectives can be a major source of social risk and wasted resources. And, as I have argued in this essay, economists can contribute more than this without sacrificing objectivity or shedding the humility to which we are so richly entitled.

and Complements," Journal of Political Economy, 93 (June),
    pp. 488-511.

CAVES, R., FORTUNATO, M., and GHEMAWAT, P., 1984, "The Decline
    of Dominant Firms, 1905-29," Quarterly Journal of Economics,
    99 (August), pp. 523-546.

CHANDLER, A.D., Jr., 1977, The Visible Hand: The Managerial
    Revolution in American Business (Harvard University Press,
    Cambridge).

COWLING, K., and MUELLER, D., 1978, "The Social Costs of Monopoly
    Power," Economic Journal, 88 (December), pp. 727-748.

DASGUPTA, P.E., 1985, "The Theory of Technological Competition,"
    in F. Mathewson and J.E. Stiglitz, eds., New Developments
    in the Analysis of Market Structure (London, Macmillan).

DEMSETZ, H., 1976, "Economics as a Guide to Antitrust
    Regulation," Journal of Law and Economics, 19 (August),
    pp. 371-84.

DIXIT, A.K., 1982, "Recent Developments in Oligopoly Theory,"
    American Economic Review, 72 (May), pp. 12-17.

EASTERBROOK, F.H., 1984, "The Limits of Antitrust," Texas Law
    Review, 63 (August), pp. 1-40.

EATON, B.C., and LIPSEY, R., 1979, "The Theory of Market
    Preemption: The Persistence of Excess Capacity and Monopoly
    in Growing Spatial Markets," Economica, 46 (May),
    pp. 149-58.

_____, 1981, "Capital, Commitment and Entry Equilibrium,"
    Bell Journal of Economics, 12 (Autumn), pp. 593-604.

FOX, E.M., 1984, "Abuse of a Dominant Position under the Treaty
     of Rome -- A Comparison with U.S. Law," in The Annual
     Proceedings of the Fordham Corporate Law Institute (Mathew
     Bender, Albany).

FUDENBERG, D., and TIROLE, J., 1983, "Learning by Doing and
     Market Performance," Bell Journal of Economics, 14 (Autumn),
     pp. 522-530.

_____, 1984, "The Fat-Cat Effect, The Puppy-Dog Ploy, and
     the Lean and Hungry Look," American Economic Review, 74
     (May), pp. 361-366.

_____, 1985, "Predation Without Reputation," Mimeo,
     Department of Economics, MIT.

FUDENBERG, D., GILBERT, R., STIGLITZ, J., and TIROLE, J., 1983,
     "Preemption, Leapfrogging, and Competition in Patent
     Races," European Economic Review, 22 (June), pp. 3-32.

GALLINI, N.T., 1984, "Deterrence by Market Sharing," American
     Economic Review, 74 (December), pp. 931-941.

GASKINS, D.W., Jr., 1971, "Dynamic Limit Pricing: Optimal
     Pricing under Threat of Entry," Journal of Economic Theory,
     3 (September), pp. 306-322.

GELMAN, J.R., and SALOP, S.C., 1983, "Judo Economics: Capacity
     Limitation and Coupon Competition," Bell Journal of
     Economics, 14 (Autumn), pp. 315-325.

GEROSKI, P., 1986, "Do Dominant Firms Decline?" this volume.

_____ and JACQUEMIN, A., 1984, "Dominant Firms and Their
     Alleged Decline," International Journal of Industrial
     Organization, 2 (March), pp. 1-27.

GILBERT, R., and NEWBERY, D., 1982, "Pre-Emptive Patenting and
the Persistence of Monopoly," American Economic Review, 72
(June), pp. 514-526.

HANNAH, L., and KAY, J.A., 1977, Concentration in Modern Industry
(London, Macmillan).

HARRIS, C., and VICKERS, J., 1985, "Patent Races and the
Persistence of Monopoly," Journal of Industrial Economics,
33 (June), pp. 461-481.

HILKE, J.C., and NELSON, P.B., 1984, "Noisy Advertising and the
Predation Rule in Antitrust Analysis," American Economic
Review, 74 (May), pp. 367-371.

HILLMAN, A.L., 1984, "Preemptive Rent Seeking and the Social
Cost of Monopoly Power," International Journal of Industrial
Organization, 2 (September), pp. 277-281.

_____ and KATZ, E., 1984, "Risk-Averse Rent Seekers and
the Social Cost of Monopoly Power," Economic Journal, 94
(March), pp. 104-110.

JOSKOW, P.L., and KLEVORICK, A.K., 1979, "A Framework for
Analysing Predatory Pricing Policy," Yale Law Journal, 89
(December), pp. 27-37.

JUDD, K.L., 1983, "Credible Spatial Preemption," Center for
Mathematical Studies in Economics and Management Science,
Discussion Paper 577, Northwestern University (Evanston),
September.

KREPS, D., and WILSON, R., 1982, "Reputation and Imperfect
Information," Journal of Economic Theory, 27 (August),
pp. 253-279.

41

LANDES, W.M. and POSNER, R.A., 1981, "Market Power in Antitrust
     Cases," Harvard Law Review, 94 (March), pp. 937-996.

LANE, W.J., Jr., 1980, "Product Differentiation in a Model with
     Endogenous Sequential Entry," Bell Journal of Economics,
     11 (Spring), pp. 237-260.

LEFFLER, K., 1985, "Toward a Reasonable Rule of
     Reason: Comments," Journal of Law and Economics, 28 (May),
     pp. 381-386.

LEWIS, T.R., 1983, "Preemption, Divestiture, and Forward
     Contracting in a Market Dominated by a Single Firm,"
     American Economic Review, 73 (December), pp. 1092-1101.

LIEBERMAN, M.K., 1984, "The Learning Curve and Pricing in the
     Chemical Processing Industries," Rand Journal of Economics,
     15 (Summer), pp. 213-228.

MANKIW, N.G., and WHINSTON, M.D., 1985, "Free Entry and Social
     Inefficiency," Discussion Paper 1125, Harvard Institute of
     Economic Research, Cambridge, Janaury.

MILGROM, P., and ROBERTS, J., 1982, "Predation, Reputation, and
     Entry Deterrence," Journal of Economic Theory, 27 (August),
     pp. 443-459.

MUELLER, D., 1977, "The Persistence of Profits Above the Norm,"
     Economica, 44 (November), pp. 369-380.

NORDHAUS, W.D., 1969, Invention, Growth, and Welfare
     (M.I.T. Press, Cambridge).

ORDOVER, J., and WILLIG, R.D., 1981, "An Economic Definition of
     Predation: Pricing and Product Innovation," Yale Law
     Journal, 91 (November), pp. 8-53.

OVERSTREET, T.R., Jr., 1983, <u>Resale Price Maintenance: Economic Theories and Empirical Evidence</u> (U.S. Federal Trade Commission, Washington).

PERRY, M.K., 1984, "Scale Economies, Imperfect Competition, and Public Policy," <u>Journal of Industrial Economics</u>, 32 (March), pp. 313-330.

POSNER, R.A., 1975, "The Social Costs of Monopoly and Regulation," <u>Journal of Political Economy</u>, 83 (August), pp. 807-828.

_____, 1976, <u>Antitrust Law: An Economic Perspective</u> (University of Chicago Press, Chicago).

PRESCOTT, E., and VISSCHER, M., 1977, "Sequential Location among Firms with Foresight," <u>Bell Journal of Economics</u>, 8 (Autumn), pp. 378-393.

REINGANUM, J., 1983, "Uncertain Innovation and the Persistence of Monopoly," <u>American Economic Review</u>, 73 (September), pp. 741-748.

ROBERTS, J., 1985, "Battles for Market Share: Incomplete Information, Aggressive Strategic Pricing, and Competitive Dynamics," Mimeo, Graduate School of Business, Stanford University.

SALONER, G., 1985, "Predation, Mergers and Incomplete Information," Working Paper 383, Department of Economics, MIT.

SALOP, S.C., 1979, "Strategic Entry Deterrence," <u>American Economic Review</u>, 69 (May), pp. 335-338.

43

_____ and SCHEFFMAN, D., 1983, "Raising Rivals' Costs,"
American Economic Review, 73 (May), pp. 265-271.

SCHARFSTEIN, D., 1984, "A Policy to Prevent Rational Test-Market
Predation," Rand Journal of Economics, 15 (Summer),
pp. 229-243.

SCHERER, F.M., 1976, "Predatory Pricing and the Sherman Act: A
Comment," Harvard Law Review, 89 (March), p. 868-890.

_____, 1977, The Economic Effects of Compulsory Patent
Licensing (New York University, Graduate School of Business
Administration, Center for the Study of Financial
Institutions, New York).

_____, 1980, Industrial Market Structure and Economic
Performance, 2nd Ed. (Rand-McNally, Chicago).

SCHMALENSEE, R., 1976, "Is More Competition Necessarily
Good?" Industrial Organization Review, 4, pp. 120-121.

_____, 1978, "Entry Deterrence in the Ready-to-Eat Breakfast
Cereal Industry," Bell Journal of Economics, 9 (Autumn),
pp. 305-327.

_____, 1979, "On the Use of Economic Models in
Antitrust: The ReaLemon Case," University of Pennsylvania
Law Review, 127 (April), pp. 994-1050.

_____, 1981a, "Economies of Scale and Barriers to Entry,"
Journal of Political Economy, 89 (December), pp. 1228-1238.

_____, 1981b, "Monopolistic Two-Part Pricing Arrangements,"
Bell Journal of Economics, 11 (Autumn), pp. 445-466.

_____, 1982a, "Antitrust and the New Industrial Economics,"
American Economic Review, 72 (May), pp. 24-28.

_____, 1982b, "Another Look at Market Power," <u>Harvard Law Review</u>, 95 (June), pp. 1789-1816.

_____, 1982c, "Product Differentiation Advantages of Pioneering Brands," <u>American Economic Review</u>, 72 (June), pp. 349-365.

_____, 1983, "Advertising and Entry Deterrence: An Exploratory Model," <u>Journal of Political Economy</u>, 91 (August), pp. 636-653.

SCHUMPETER, J., 1942, <u>Capitalism, Socialism, and Democracy</u> (Harper, New York).

SCHWARTZ, M., 1984, "Welfare Effects of Exit-Inducing Innovations," Discussion Paper 84-12, Economic Policy Office, U.S. Department of Justice, Washington, September.

SPENCE, A.M., 1977, "Entry, Capacity, Investment and Oligopolistic Pricing," <u>Bell Journal of Economics</u>, 9 (Autumn), pp. 534-544.

_____, 1981a, "Competition, Entry, and Antitrust Policy," in S. Salop, ed., <u>Strategy, Predation, and Antitrust Analysis</u> (U.S. Federal Trade Commission, Washington).

_____, 1981b, "The Learning Curve and Competition," <u>Bell Journal of Economics</u>, 12 (Spring), pp. 49-70.

STIGLER, G.J., 1950, "Monopoly and Oligopoly by Merger," <u>American Economic Review</u>, 40 (May), pp. 23-34.

_____, 1964, "A Theory of Oligopoly," <u>Journal of Political Economy</u>, 72 (February), pp. 44-61.

_____, 1965, "The Dominant Firm and the Inverted Umbrella," <u>Journal of Law and Economics</u>, 8 (October), pp. 167-171.

45

TULLOCK, G., 1980, "Efficient Rent-Seeking," in Buchanan, J.M.,
    Tollison, R.D., and Tullock, G., eds., Toward a Theory of
    the Rent-Seeking Society (Texas A&M University Press,
    College Station).

U.S. DEPARTMENT OF JUSTICE, Merger Guidelines, June 14, 1984,
    in Special Supplement, Antitrust and Trade Regulation
    Report, S-1-S-16 (June 14, 1984).

VARIAN, H., 1985, "Price Discrimination and Social Welfare,"
    American Economic Review, 75 (September), pp. 870-875.

WEISS, L.W., and PASCOE, G., 1984, "The Extent and Permanence
    of Market Dominance," IIM/IP Discussion Paper 84-23,
    International Institute of Management (Berlin), July.

von WEIZSACKER, C.C., 1980a, Barriers to Entry: A Theoretical
    Treatment (Springer-Verlag, Berlin).

_____, 1980b, "A Welfare Analysis of Barriers to Entry,"
    Bell Journal of Economics, 11 (Autumn), pp. 399-420.

WILLIAMSON, O.E., 1968, "Economies as an Antitrust Defense: The
    Welfare Tradeoffs," American Economic Review, 58 (March),
    pp. 18-34.

_____, 1977, "Predatory Pricing: A Strategic and Welfare
    Analysis," Yale Law Journal, 87 (December), pp. 284-340.

FOOTNOTES

*I am indebted to Ian Ayres, Paul Geroski, Paul Joskow, Garth Saloner, the Editors, and the other Conference participants for useful comments on an earlier version of this essay. The usual waiver of liability applies, of course.

1. U.S. v. Aluminum Company of America, 148 F.2d 416 (1945).

2. Fox (1984) provides a nice discussion of the cases decided by the EC Court of Justice under Article 86 of the Treaty of Rome and a comparison with US antitrust law.

3. Remarks of Robert B. Shaprio, in "Antitrust in Transition: Two Dialogues," The Conference Board, Research Bulletin 184, New York, 1985, p. 21. In the original, oral version of these remarks, the phrase was "winner-bashing."

4. These points and the arguments of the next paragraph are developed in Landes and Posner [1981] and Schmalensee [1979, 1982].

5. U.S. v. E.I. Dupont de Nemours and Company, 351 U.S. 377 (1956).

6. See also Roberts [1985] for an excellent overview of recent theoretical work. I must quarrel with Geroski and Jacquemin's [1984, pp. 3-5] decision to define dominance by the presence of strategic advantages. This departs from conventional usage in a potentially confusing direction, since even incumbent firms with very little market power may have strategic advantages over potential

47

entrants; see, for instance, Bernheim [1984], Lane [1980], and Prescott and Visscher [1977].

7. On the conditions necessary for rational preemption of technological opportunities, see, for instance, Dasgupta [1985], Fudenberg, et al [1983], Harris and Vickers [1985], Lewis [1983], and Reinganum [1983]. In an interesting variation on this theme, Gallini [1984] has shown that it may pay an incumbent dominant firm with patent protection to license that patent to a potential entrant (i.e., to premit entry) in order to prevent unprofitable competition to develop a better technology or product. Judd [1983] has recently pointed out some difficulties in making credible preemptive investments in new products.

8. J. Moody, 1904, The Truth about the Trusts (Moody, New York), p. 487; cited in Stiger [1950]. For overviews of these "mergers for monopoly", as Stigler calls them, and the associated early literature, see also Caves, et al [1984] and Chandler [1977].

9. Suppose share decays exponentially, with share t years after formation given by $S(t) = S(0)\exp(-kt)$. Setting $S(0) = .66$ and $S(24) = .42$, one obtains $k = .0188$, which implies $S(36.9) = S(0)/2$.

10. The U.S. Steel merger seems an exception to this generalization. It occurred in the right sort of industry and was clearly successful (Stigler [1965]). In Chandler's [1977, p. 342] tabular analysis of mergers, he describes the firm as "integrated," but he notes later [p. 361] that

until the 1930's, U.S. Steel "continued to be a holding company that administered its many subsidiaries through a very small general office," which "did little to coordinate, plan, and evaluate for [sic] the activities of the subsidiaries." The firm thus "remained little more than a legal consolidation." Since production was not rationalized and control was not centralized, it is hard to imagine that U.S. Steel had operating advantages over its rivals or was capable of exploiting any strategic advantages it may have possessed.

11. Easterbrook [1984] and Leffler [1985] discuss the difficulty of proving, especially to judges and juries, that particular rules or remedies are likely to enhance efficiency. They basically conclude that vigorous competition should replace economic efficiency as the standard for evaluating antitrust proposals. I am broadly sympathetic to this general position and to much of their discussions of its implications. But I think Leffler errs badly when he essentially equates [p. 385] injury to competition with injury to competitors. Investments that lower the costs of a dominant firm generally injure its competitiors, but it makes no sense to outlaw cost reduction for this reason.

12. The relevant literature includes contributions by Areeda and Turner [175, 1976], Baumol [1979], Joskow and Klevorick [1979], Ordover and Willig [1981], Posner [1976], Scherer [1976], Schmalensee [1979], Schwartz [1984], Williamson

49

[1977], and others. For a nice overview of this literature and a discussion of some key cases, see the opinion of Judge Stephen Breyer, Barry Wright Corp. v. ITT Grinnell Corp, et al, U.S. Court of Appeals for the First Circuit, 29 December 1983 (reprinted in Commerce Clearing House, Trade Cases, 1984-1, pp. 67252- 67263.).

50